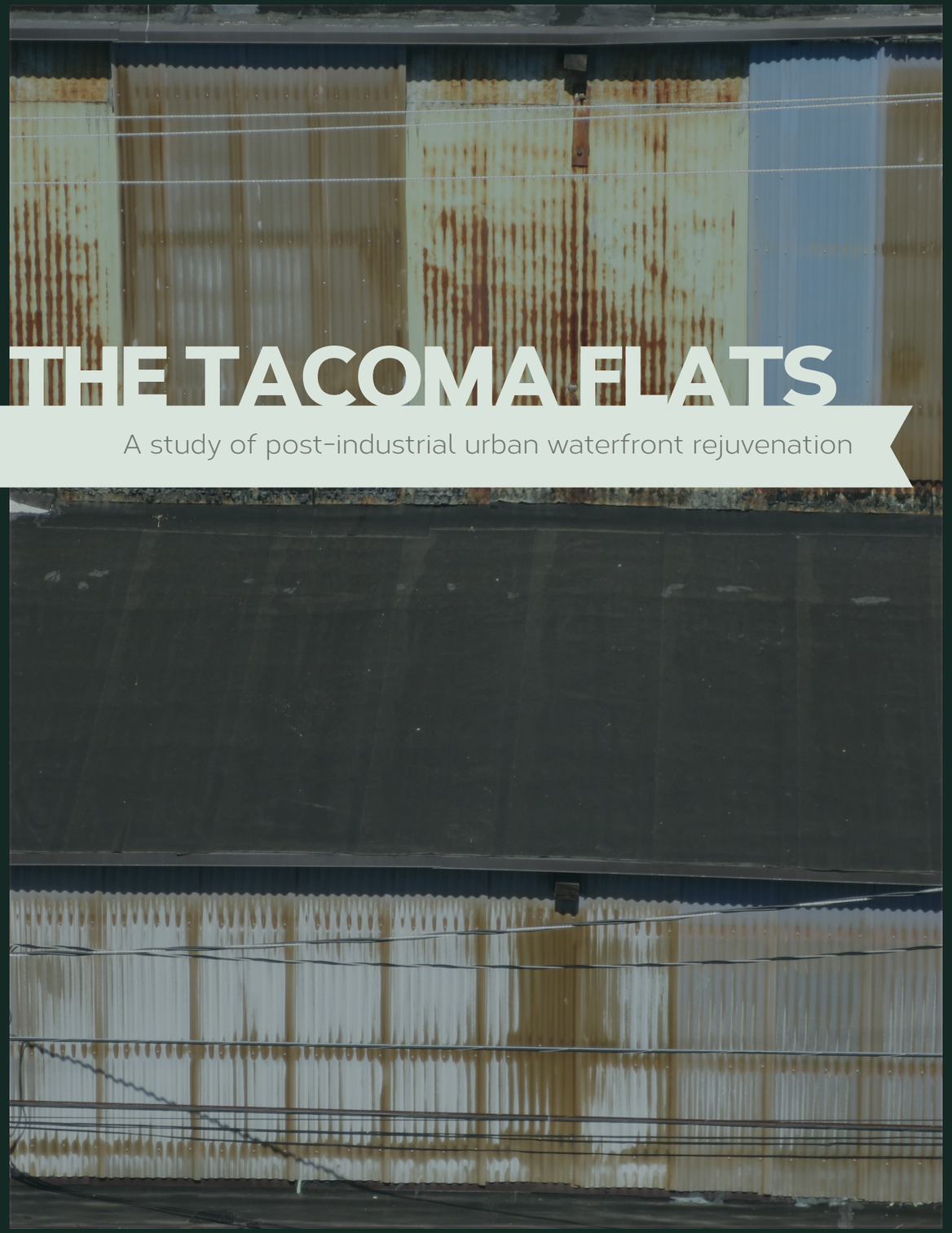
THE TACOMA FLATS

A study of post-industrial urban waterfront rejuvenation



THE TACOMA FLATS

A study of post-industrial urban waterfront rejuvenation

A master's report submitted to the faculty of the
COLLEGE OF ARCHITECTURE, PLANNING, AND LANDSCAPE ARCHITECTURE
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I would also like to thank my family and friends for their continued patience and support.

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INTRODUCTION

Named after nearby Mount Rainier, Tacoma has been on a slow but steady rebound from the economic decline of a post-industrial nation. Founded at the terminus of the Northern Pacific Railroad in 1873, Tacoma's economy was historically based largely on the exportation of natural resources, such as timber and coal. Although still trying to find its stride, this Pacific Northwest city has retained, for the most part, the blue collar industrial grit that the city was originally founded on.

Like most industrial cities, Tacoma suffered a prolonged decline in the mid-20th century. An effect of suburbanization and disinvestment, the city still finds many of its historic structures and vacant parcels largely underutilized.

However, since the 1990's, the city has felt some effects of reinvestment. The University of Washington integrated a Tacoma campus into the Downtown core, Tacoma Link, the state's first light rail line, and the Thea Foss Waterway urban waterfront redevelopment all helped to provide the local economy with a much needed boost. Additional investments in the downtown include the restoration of Union Station and the creation of the Museum District, which includes The Museum of Glass, Bridge of Glass, Tacoma Art Museum, Washington State History Museum, Lemay-America's Car Museum, Children's Museum of Tacoma, and Foss Waterway Seaport - a century-old shipping warehouse and maritime heritage educational center. Tacoma also posses a thriving theatre district.

Perhaps we have disinvestment to thank for the lack of redevelopment that has ultimately lead to the preservation of vast blocks of historic Tacoma. This fact, along with a more affordable housing market, and greater investment interest help lay the foundation for a future as a complete and healthy metropolitan center. This city inherently holds many of the desirable amenities, spatial arrangements, and historical vernacular that other cities around the country are trying to recreate post urban renewal era.

The Tacoma Flats programming and design makes many assumptions regarding the future of this city - a fully realized economy, a large regional population expansion, and increased efficiencies in port functions. This 2050 vision is just that, a glimpse of how underutilized former industrial areas adjacent to the downtown core could be used to accommodate the growth, health, and ecological function of this historically rich region of the Puget Sound. The Tacoma Flats 2050 vision is simply the realization of possibilities.

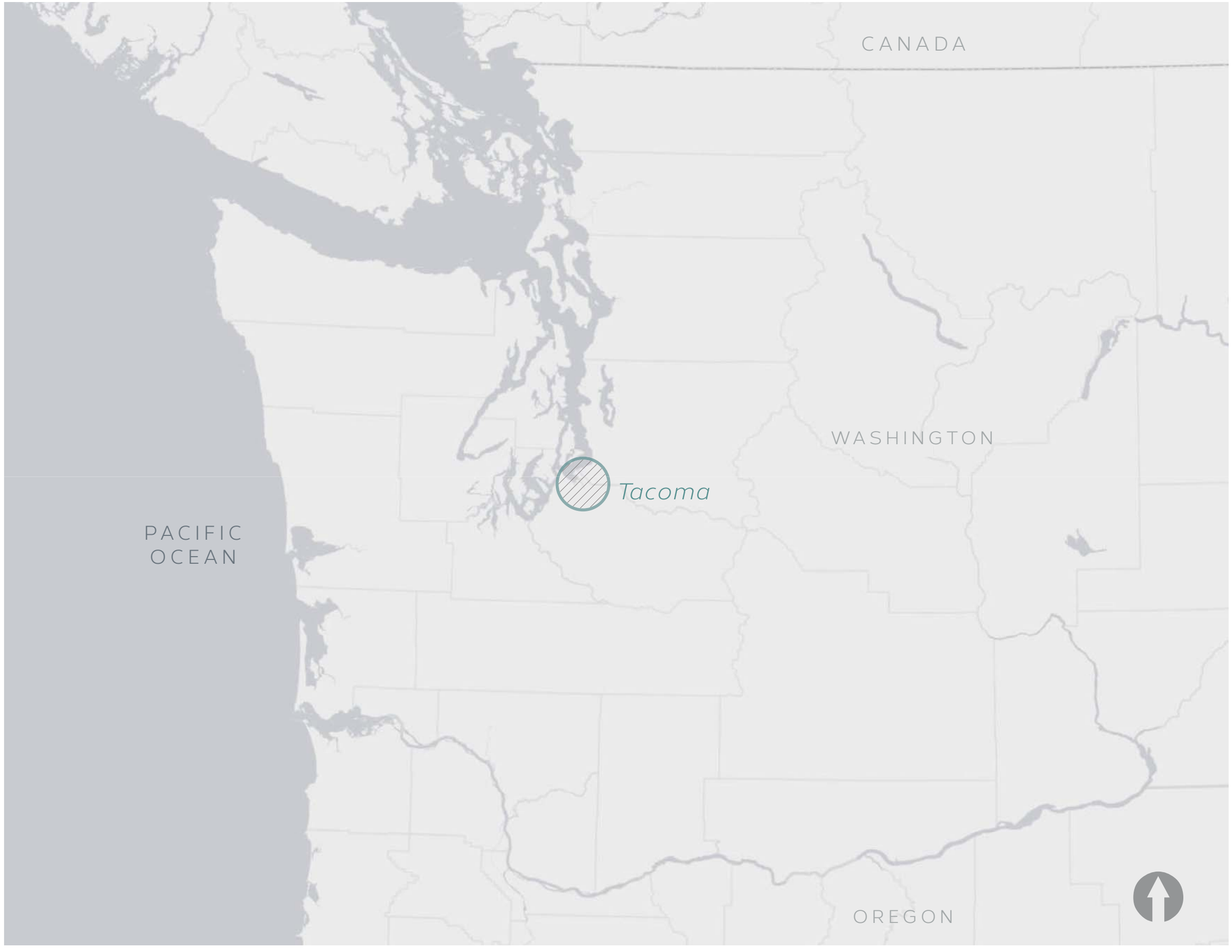
PNW

Tacoma is located within the Pacific Northwest. This is a region defined by Oregon, Washington and portions of Southern British Columbia, bounded by the Pacific Ocean to the west and the Rocky Mountains to the east.

The Pacific Northwest is an extremely diverse geographic region with several major mountain ranges including the Cascade, Olympic, and Columbia ranges, many of which still contain active volcanoes. Because many areas receive abundant rainfall and experience relatively cool summers, the region has some of North America's most extensive forests – dominated by the Douglas fir, the earth's second largest conifer. Other regional forest types include ponderosa pine, coastal redwood, and oak woodland.

Because of the effects from the Pacific Ocean and the orientation of the major mountain ranges, climate variations can be extreme in this region. Between the ocean and high mountain rage, a costal climate occurs with wet winters and mild summer. On the wayward side of high mountain ranges climate tend to be much more arid, with warm summers. Some windward portions of costal ranges experience so much rainfall, in fact, they are categorized as temperate rainforest, receiving in excess of 200 inches of precipitation annually.

The Pacific Northwest has been occupied by a diverse array of Indigenous American peoples for millennia, beginning with peoples who explored and colonized the area roughly 15,000 years before Europeans arrived. The Pacific Coast



is seen by a growing number of scholars as a major migration route for late Pleistocene peoples moving from northeast Asia into the Americas. Archaeological evidence for these earliest indigenous peoples is unclear–in part because heavy glaciation, flooding, and post-glacial sea level rise have radically changed the landscape–but fluted Clovis-like points found in the region were probably left by Paleo-Indians at least 13,000 years ago. Even earlier evidence for human occupation dating back as much as 14,500 years ago is emerging from Paisley Caves in central Oregon.

Due in part to the richness of Pacific Northwest coast and river fisheries some of the indigenous peoples developed complex sedentary societies while remaining hunter-gatherers. The Pacific Northwest Coast is one of the few places where politically complex hunter-gatherers evolved and survived to historic contacts, and therefore has been vital for anthropologists and archaeologists seeking to understand how complex hunter and gatherer societies function. When Europeans first arrived on the Northwest Coast they found one of the world's most complex hunting and fishing societies, with large sedentary villages, large houses, systems of social rank and prestige, extensive trade networks, and many other factors more commonly associated with societies based on domesticated agriculture.

In the interior of the Pacific Northwest the indigenous peoples, at the time of European contact, had a diversity of cultures and societies. Some areas were home to mobile and egalitarian societies. Others, especially along major rivers such as the Columbia and Fraser, had very complex, affluent, sedentary societies largely reflective of those found along the Pacific Northwest coast (The Oxford Handbook of North American Archeology).

Current populations in this region vary immensely, from vast uninhabited expanses of forest to the densely populated urban centers of the Portland-Seattle-Vancouver corridor. This greater corridor region is estimated at a population of around 8 million people (2004 Census).

Within the State of Washington lies the Puget Sound Region and includes the cities of Everett, Seattle, Tacoma, and Olympia, along with many other small interconnected municipalities. This area is not only linked by transit, economy, and history, but culture as well.

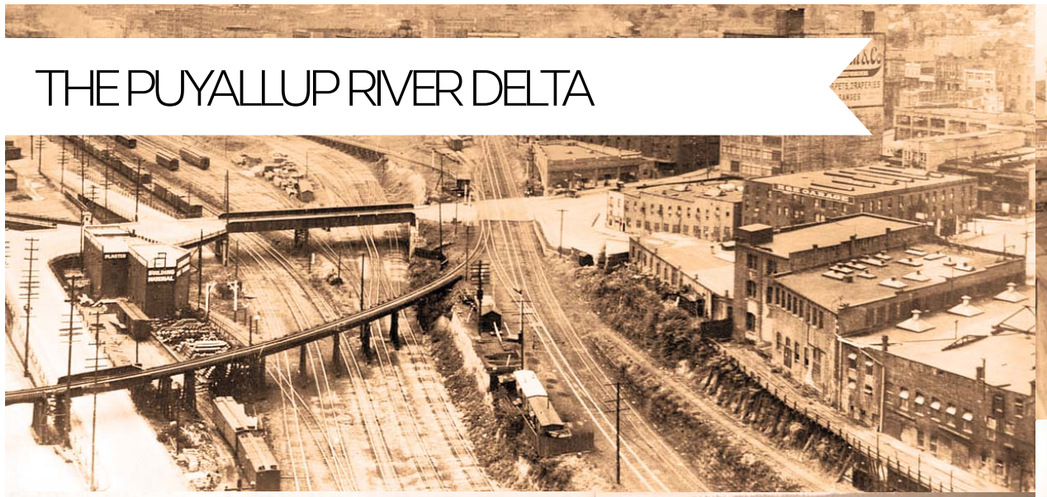
PORT OF TACOMA

The Port of Tacoma is among the top ten largest container ports in North America, cover more than 2,700 acres. Each year the port handles between 9 and 13 million tons of cargo and more than 25 billion dollars in commerce. Major exports include grain, soybeans and timber products, the largest being grain by way of the Midwest. The port also imports large quantities of automobiles and electronics from Asia. China and Japan both rank at the top of the list for overall exchange of goods.

In addition to general import export functions, the Port of Tacoma also operates an oil refinery and one of the largest paper mills in the Pacific Northwest. Numerous maritime industrial, heavy industrial and light industrial companies are also associated with the port, including a large number of private boating and marina functions.

Although functions continue to grow as trade increases, the Port of Tacoma operates under capacity. This is expected to continue because of advancements in port technology and efficiencies. This leaves large parcels of the port underutilized, increasing new infrastructure costs, reducing tax incomes, and putting pressure on the port from other expanding industries.

THE PUYALLUP RIVER DELTA

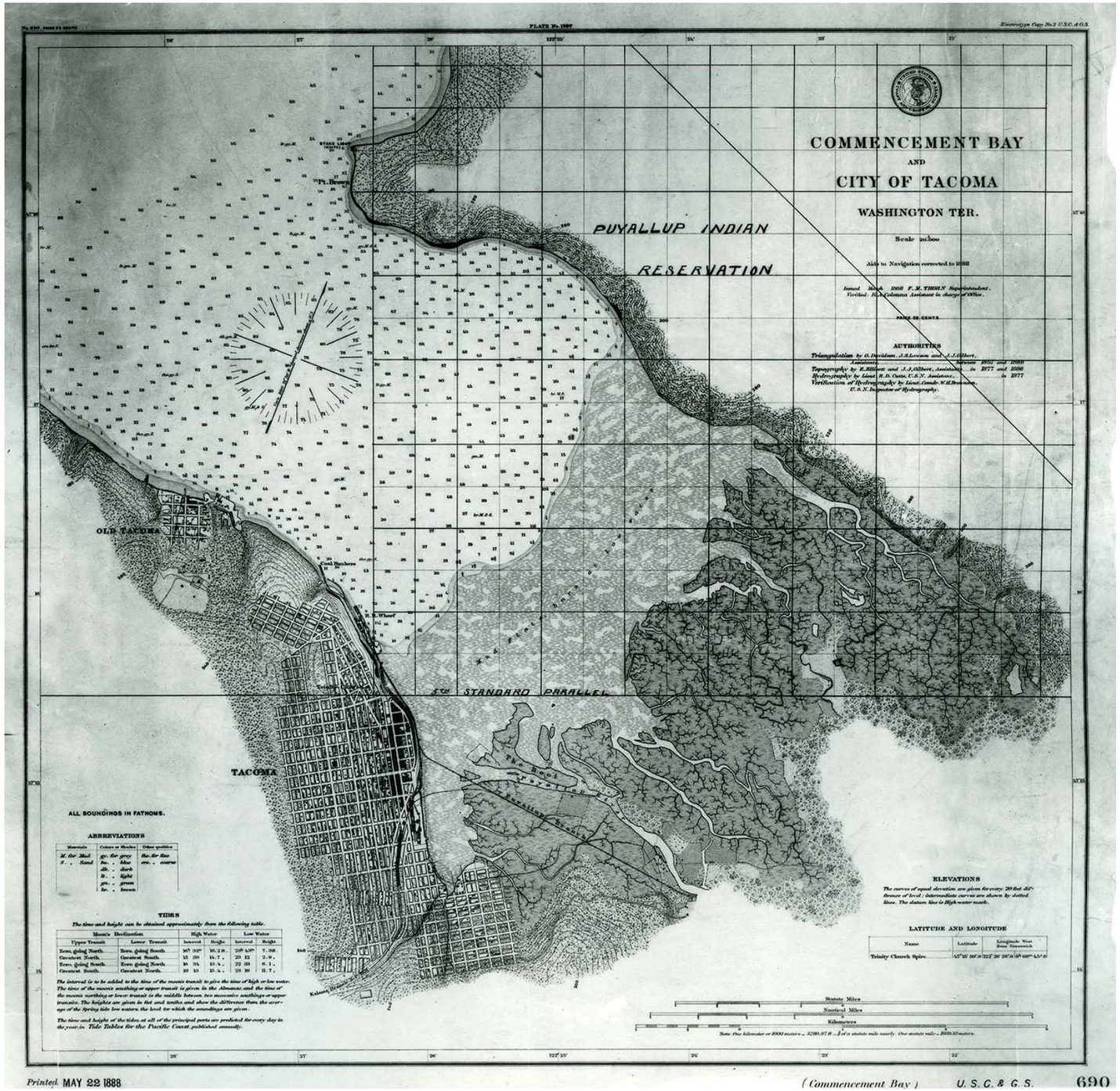


INDUSTRY

In 1852, a Swedish immigrant named Nicolas Delin constructed a water-powered sawmill along the headwaters of the Puyallup River. This began the settlement and transformation of the delta into one of the most productive ports on the Pacific Coast.

Over the next 150 years, the once highly productive costal habitat of the Puyallup River delta saw rapid conversion of its estuaries and mudflats into industrial sites, Spurred on by growth of the port as a terminus for natural resource processing and exportation, this once productive river ecosystem was straightened, diked, and suppressed. Although the understanding of such long-term consequences were certainly unrealized at the time, the actions would forever cripple the health of an entire regional ecosystem with habitat loss for keystone species like the salmon and Olympia oyster. In addition, massive amounts of industrial grade toxins were released into Commencement Bay and surrounding waters.

As the port continued to flourish, the local economy saw rapid diversification of supporting industries. Financial commerce, paper and timber industries, housing construction, and service sector industries exploded around the young port. Bridges were raised, roads were constructed, and bulkheads were erected, all in an effort to fortify the site against the ever-present inclinations of natural processes that had been the influence for thousands of years.

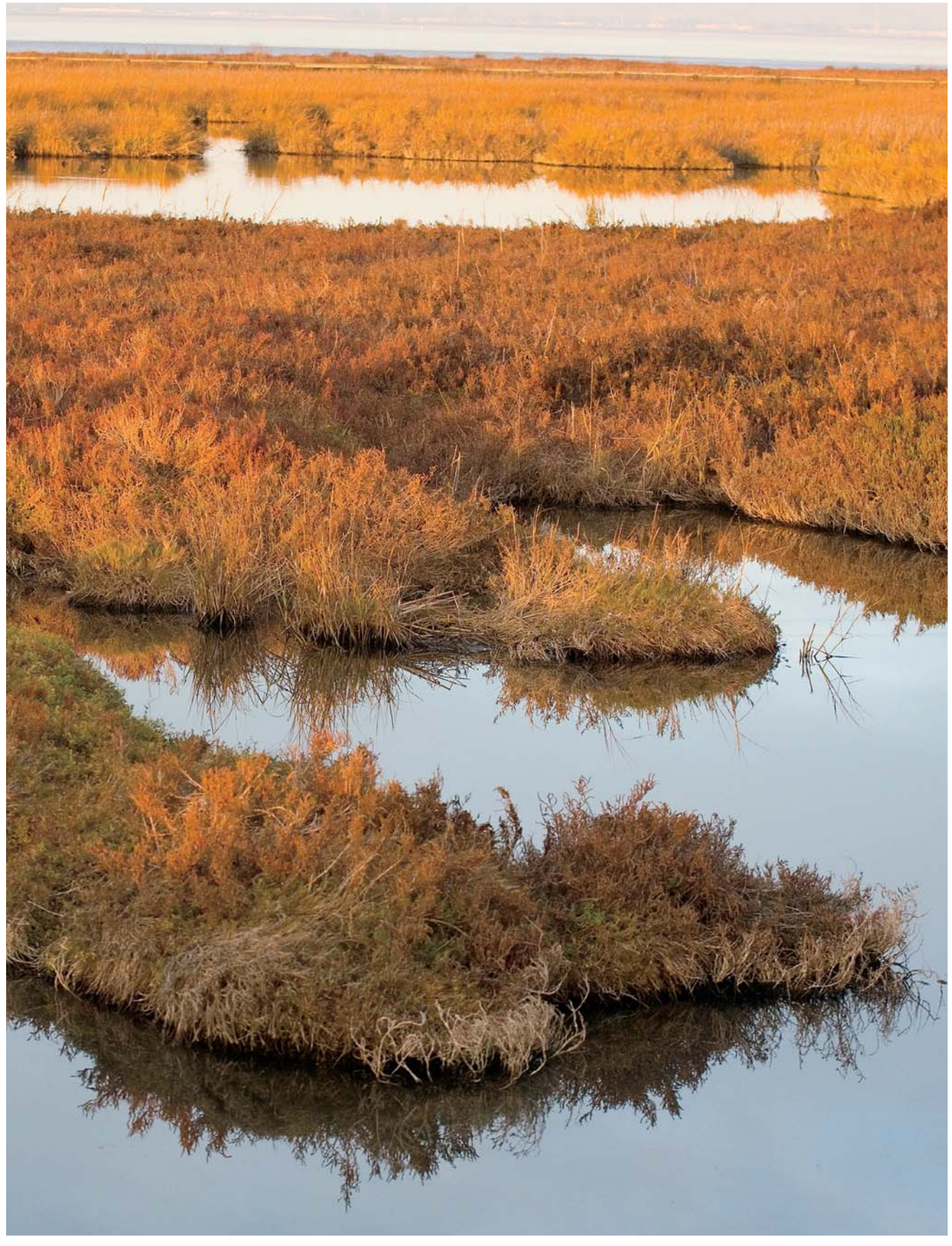


ECOLOGY

Before the large dredging efforts of the 19th century, Commencement Bay and the Puyallup River Delta covered extensive areas of freshwater floodplains. One of the numerous factors that made this estuarine transition zone such an important part of the ecological services network within the Greater Puget Sound region was the massive deposition of sediment and organic detritus from the Puyallup River. These depositions spread out across the floodplain creating prime habitat for a diverse array of species, with the emphasis on juvenile salmon.

During the early 1900's, the fan-like streams within the delta were channelized and tideflats filled in order to stabilize the banks for the eventual dredging of the 8 major industrial waterways found at the port today. These actions eventually heavily altered any natural ecological functions within the area. Several integral salmon spawning grounds were destroyed.

In the early 1980's, following a long-term, detailed assessment of the conditions surrounding the Commencement Bay sediment, it was determined that there was widespread contamination due to a number of local sources. In 1983, the Commencement Bay Nearshore/ Tideflats was added to the National Priorities List for EPA Superfund Sites. Although extensive cleanup efforts have taken place, The cleanup and restoration of the of the area continues to be an ongoing effort.



The most regionally and culturally important species that was negatively effected by the massive transformations of the Puyallup River Delta was the Chinook salmon. This is especially true of juveniles and their integral relationship with the historic estuarine mudflat of the delta. These salmonoids require shallow, tranquil nearshore waters when they undergo the transitional period from freshwater to saltwater habitats. Young salmon are also highly susceptible to predation during this transitional stage from freshwater to saltwater habitats. The majority of this predation comes from larger fish species. These once shallow flats provided excellent cover for the vulnerable salmonoids by creating habitat that is inaccessible to large fish species.

Due to the long term toxin release from a number of industries in the area, including paper mills and smelters, deep deposits of sediment contamination within Commencement Bay has had serious implications for the young salmon. Because the juvenile salmon are undergoing a sensitive transition, they are much less resistant to these contaminants (Stehr et al 1999). The National Marine Fisheries conducted a study that found levels of contaminants in juvenile salmon to cause “extensive biological injury”.

Due to intensive dredging and channelization of the former ecological functioning sites, the number of suitable sites for salmon maturation, and eventual return for spawning has greatly decreased.

PUYALLUP TRIBE

Today know as the Puyallup Tribe, in their aboriginal language, the Puyallup people were known as the S'Puyalupubsh, meaning "generous and welcoming behavior to all people (friends and strangers) who enter our lands." These First Peoples could be found throughout the Puyallup River Basin, up to the foothills of Mount Tacoma (Rainier). They are a part of the larger Salish speaking people of the Pacific Northwest. Historically, these people lived on the "natural wealth" provided by the surrounding ecosystem: salmon, shellfish, wild game, roots, berries, and some of the cleanest water on the continent. This tribe leaned on the native cedar tree to provide the foundation for homes, utensils, clothing, and vessels.

As with all of the First People of this nation, their inviting culture was taken advantage of and, in the end, were left with small disconnected plots of their former lands.

Today, the Puyallup Tribe has regained some relevance in local government, now owning portions of the delta and having a stake in much of the local decison-making. The tribe stills relies heavily on the salmon that run the Puyallup River throughout the summer and fall months, although the run is a fragments of its former bounty. The tribe has several boat launching sites along the dikes of the Puyallup, although some nothing more than a concrete slab. These people would benefit greatly from the regeneration of former ecological services provided by this delta.

CASE REVIEWS

WESTERN HARBOR
MALMO, SWEDEN

Western Harbour is on the shoreline of the Öresund Sound and sits on what used to be the Kockums shipyard. The city took on this contaminated, dilapidated area and working with property developers and designers, has turned it into a paragon of a sustainability. The site is 100% powered by local renewable energy sources, uses and extensive system of green infrastructure to mitigate stormwater and contaminant runoff. The local busses are powered by biogas from residents' waste, rain is channelled into beautiful water features, and waterfront parks and promenades have become wildly successful destinations for residents and visitors.

The development of Western Harbor would not have been possible without the partnerships established between the city and developers, with the City of Malmo only selling the properties contingent on development benefiting all parties. This same framework could be mirrored to assure The Tacoma Flats becomes a city of the future.

ANCHOR PARK
MALMO, SWEDEN

As one of the major focal pieces of Western Harbor, Anchor Park is part of a major network of green infrastructure that mitigates stormwater. This park has been used countless times as an archetype for highly integrated, usable green infrastructure. With cues from surrounding ecological niches, this thematic design incorporates a program that attempts to mimic local alder marshes, oak woodlands, and saltwater biotypes. The park is used to literally anchor this new sustainable village into the surrounding natural context that is Sweden.

This level of green infrastructure should be integrated into every aspect of both design and engineering within the The Tacoma Flats. Every structure should mitigate for rainwater on site and to the fullest extent possible. All transportation infrastructure should be linked by an extensive network of stormwater mitigation features - swales, detention ponds, permeable surfaces, rain gardens.

GRANVILLE ISLAND
VANCOUVER, BRITISH COLUMBIA

The formal industrial site is now known for its multitude of public markets, cultural events, and play areas, The Granville Island model has succeeded by slowly evolving organically alongside the many commercial institutions that help to anchor the area. This wonderful example of urbanism was not part of any original design, master plan, or function of municipal government. However, the steadily increasing number of amenities, has turned the area into a destination for residents and tourists alike. Because of its central location, access to public transportation, and opportunities for public interaction with a working waterfront, the site is experiencing an economic surge from surrounding high-rise infill projects. A prime example of a successful public space with little initial monetary support.

IJBURG
AMSTERDAM, NETHERLANDS

To help the city deal with an excessive housing shortage, Ijburg was raised from the Ijmeer Lake beginning in 1996. The neighborhood currently consists of three artificial fill islands connected by a series of bridge spans that will ultimately accommodate 45,000 residents with 12,000 employment opportunities. Originally designed as 10 islands, phase 2 has been put on hold as the local government deals with the looming issues surrounding heavy environmental degradation from the massive fill projects. Overall, this ongoing expansion has been wildly successful due to the development guidelines that foster architectural diversity, rather that large singular block development, Ijburg has managed to integrate itself into the surrounding urban context, rather than socially disconnect its residents like many master planned developments often do.

MERCER SLOUGH
BELLEVUE, WASHINGTON

The Mercer Slough Nature Park, part of an abandoned meltwater channel that was formed during the glaciation of the Puget Sound Lowlands, is a 320-acre restored wetland system and educational center. The park houses multitudes of terrestrial and aquatic species and its lowlands and waterways are crossed by a network of elevated pedestrian pathways. The educational component is very prominent as seen in the numerous educational experiences that dot the path network - with the well designed Mercer Slough Environmental Education Center as the centerpiece.

The success of The Mercer Slough can be directly translated for many opportunities within The Tacoma Flats. Building on the incredible history of the site, both cultural and ecological, the educational components should be the basis for much of the pedestrian experience along the shorline promenades, within the public parks, and along the restoration sites.

DUWAMISH RIVER
SEATTLE, WASHINGTON

For more than a century, the dumping of industrial and urban wastes into the Duwamish River have left the water, sediments, beaches, fish, and shellfish heavily contaminated with a mix of 41 toxic chemicals. In 2001, the EPA placed 5.5 miles of the Lower Duwamish on the Superfund national priorities list. Traditionally, the Duwamish Tribe relied heavily on both salmon and shellfish harvests from the area. With the exception of annual salmon runs, this practice is largely prohibited.

Currently the EPA and Washington Department of Ecology have begun the massive undertaking of mitigating contamination and beginning to restore sections of shoreline. This is of interest to the future cleanup of The Tacoma Flats, which harbor some of the same toxins within its sediments and waterways. The local Puyallup Tribe relies on local harvests in the same fashion as the Duwamish.

NISQUALLY ESTUARY
WASHINGTON STATE

In November of 2009, following a century of diking the flow from the Nisqually River, The Brown Farm Dike was removed and the river was allowed to once again inundate 308 ha of wetlands within the greater Nisqually Delta. This ongoing project represents the largest tidal marsh restoration project in the Pacific Northwest aimed specifically in the recovery efforts of Puget Sound salmon and native wildlife populations. Over the course of the past decade, a network of partnerships, including the Nisqually Tribe, Ducks Unlimited, and the US Fish and Wildlife Service, have restored over 35 miles of historic tidal slough and floodplains, increasing salt marsh habitat in the Puget Sound by 50%. This restoration effort is expected to result in a considerable increase in regional ecological services (nisquallydeltarestoration.org).

Although The Tacoma Flats lie within an intensely urban site, the partnership and process framework could be mirrored, as the fundamental goals are the same.

ALAMEDA POINT
ALAMEDA, CALIFORNIA

At the site of the former Alameda Naval Air Station, the 2,634 acres encompassing Alameda Point has experienced over 80 years of noxious industrial waste deposition within its sediment and surrounding waters. Now an EPA Superfund site, Alameda Point is experiencing both an urban and ecological revival. Much of the former military infrastructure is being repurposed into a bustling and vibrant community that is being grown from the preservation of it's historic foundation. In addition, a massive long-term cleanup and restoration project is underway to reinstitute a large portion of estuarine habitat that was filled-over during construction of the installation. The end result will be a 100 acre marsh habitat that restores major ecosystem services for the area.

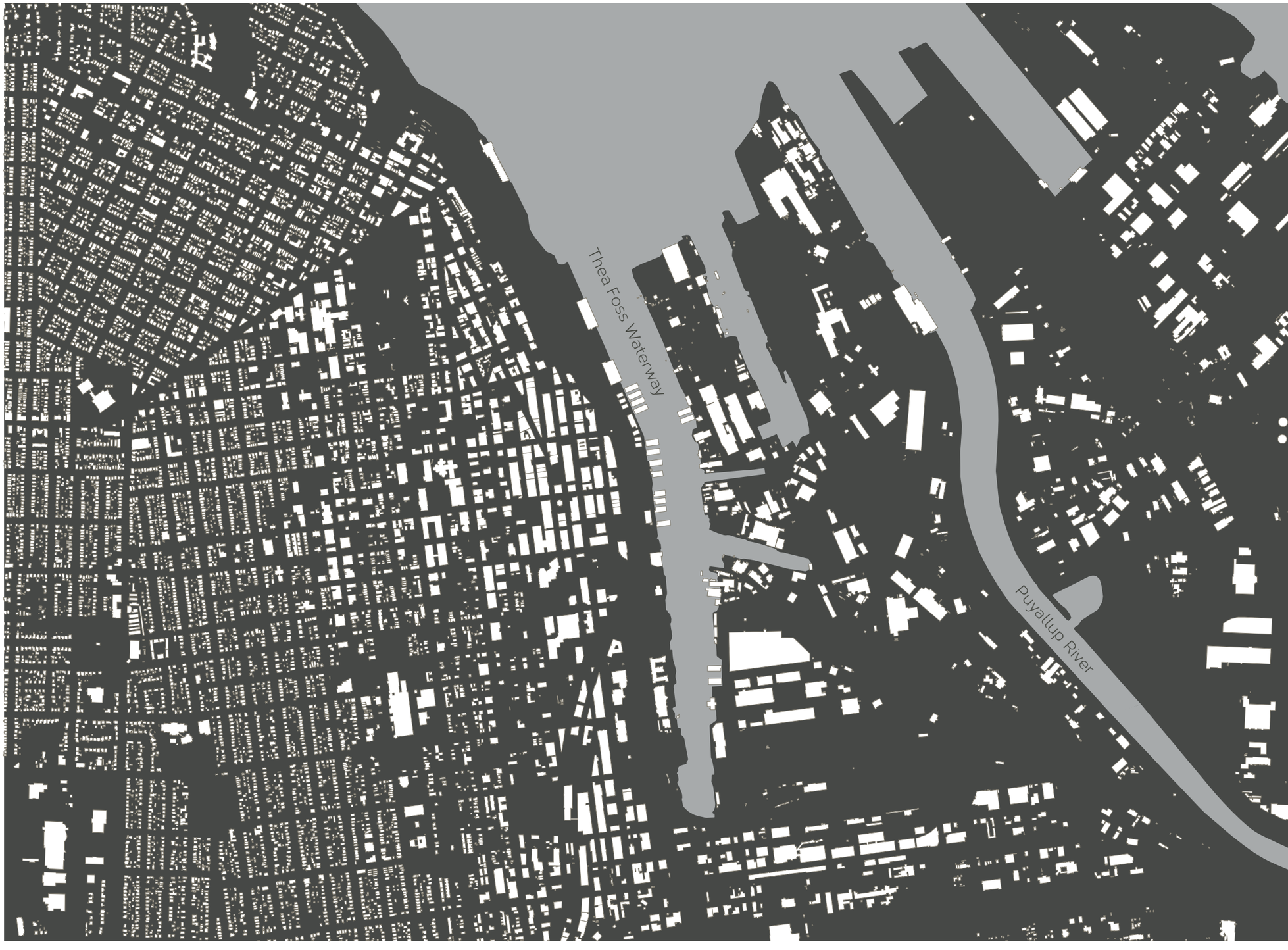
Because of the successful cleanup efforts and repurposing of historic military structures, Alameda Point has major implications for The Tacoma Flats. Much of the same mitigation and restoration efforts apply directly to the current site.

ANALYSIS

CONTEXT

As seen from this figure-ground diagram, there is a stark contrast between the organization of Tacoma's downtown grid on the left and the redeveloped industrial port areas to the right. Because the Downtown has retained the majority of its historic integrity, it remains walkable, dense, and appropriately scaled as it did 100 years ago. Just across the Thea Foss Waterway, the industrial areas have gone through a drastic transformation from tidal flat, to industrial-residential, to heavy maritime industrial. This transformation has been the effect of refocusing the port to rail and cargo functions. This city-owned section of the port now sits largely underutilized, with numerous vacant sites and dilapidated warehouses.

A retooling of the area's roads and infrastructure is needed to readapt the site for human-scaled functionality. Naturally, this effort will take major cues from the downtown, just across the water. The establishment of a small-block grid will help to link the downtown with a new urban area on the underutilized port site.



CONSTRAINTS

Although currently there are numerous constraints that would hinder much of the redevelopment of this site, it is to be assumed that many of the hurdles would be navigable in the future. Due to the "visioning spirit" of this document, much of the political and regulatory hindrances are to be considered, but ultimately understood to be intangible constraints, and therefore conditionally flexible. As political processes on every level ebb and flow, it is safe to assume that many regulations currently in effect, could one day be deemed unnecessary.

Physical constraints, however, are tangible now and will be in the future. So, these physical constraints such as sea level rise, bulkhead deterioration, and severely aging infrastructure should all be considered during the synthesis process. In addition, populations will continue to grow, urbanization will continue to occur, and the economy will continue to move away from being fundamentally manufacturing based, to one of technology and services. These market factors should also be integrated into synthesis and programming. Designing flexibility around predictability will only help to strengthen the case for social remediation of this site. With these considerations in mind, the following is a soft list of site constraints to be considered:

Shorline regulations

Both the State of Washing and City of Tacoma have strict Shoreline Management Acts and regulation limiting further disturbance or

destruction of shoreline habitat. Section 13.11 of Tacoma's Shoreline Master Programs restricts the following: "... any activity which would destroy the natural vegetation; result in a significant change in critical habitat, water temperature, physical, or chemical characteristics; or alter natural contours and/or substantially alter existing patterns of tidal, sediment, or stormwater flow on any land which meets the classification standards for any critical area defined herein. Such activities include excavation, grading, filling, the removal of vegetation, and the construction, exterior alteration, or enlargement of any building or structure".

Sea Level Rise

According to findings by the Washington Port Association, sea level rise in the Puget Sound is expected to increase approximately 12 inches by 2050, according to some models. Along with this rise comes more extreme storm events with flooding, inundation, and erosion. Sections of the port bulkhead and fill are already seeing the effects of age, with serious fill erosion during large weather events. Planning for sea level rise needs to be taken into account in the design. Larger setbacks, higher levels of fill, and ecological buffers can all work together to help mitigate negative effects from sea level rise. With inundation, salt water will be pushed deeper into estuarine habitats, increasing the need to remove dikes to allow for these sensitive habitats to push back as well.

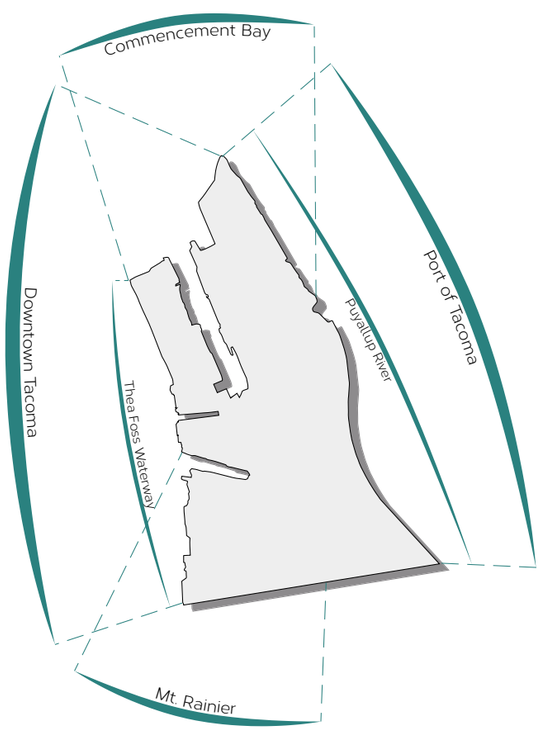
Geological Activity

Earthquakes are always a threat in the Pacific Northwest. The region is prime with geological activity. Earthquakes in the Tacoma area originate from the Juan de Fuca subduction plate, located just below the Puget Sound, this plate experiences earthquakes as large as a magnitude 7. Magnitude 9 and larger earthquakes generally occur along the larger North American plate, located on both sides of the Cascade Mountains (USGS Earthquake Hazard Program 2012). Earthquakes from either of these sources have the potential to trigger landslides, liquefaction, and tsunamis, all of which would have devastating effects on the entire port area. Another potentially catastrophic effect of local tectonic subduction would be the eruption of Mount Rainier. Such an eruption would send lahar, a massive mudflow, down the Puyallup River Valley towards Tacoma. This type of event is almost impossible to mitigate for, other than reducing development within the flow zone.

Thea Foss Waterway

With only two bridges linking the site to the rest of Downtown, the Thea Foss Waterway presents a significant barrier to non-motorized flow. This will have to be mitigated on a number of fronts, including generous bridge crossing lanes for pedestrians and cyclists, linking the site up with current lightrail lines, and looking and alternative transportation options like water taxis and gondola lifts.

VIEWSHED ANALYSIS



OPPORTUNITIES

The physical opportunities of the site are quite abundant. It is situated in an area that could allow it to become the nexus for both cultural and economic growth within the South Sound Region. Situated between the historic character of Downtown Tacoma, and the bustling industry at the Port of Tacoma, the site it directly linked - physically, culturally, and historically - to the rich waters of the Puget Sound and abundance of the Cascade forests.

This site is an urban waterfront with all of the nuances that come with that title. This includes the opportunity to build upon the current economics as a working waterfront, by programming for areas of increased maritime industries and supporting industries of research and development. With a close adjacency to Downtown Tacoma, new opportunities for amenity centers that compliment many of the amenities in the downtown are abundant.

One of the greatest amenities on site are the views. Because it is situated just above sea level, views from the site into Downtown Tacoma, which sits on a hillside, are panoramic. In addition, on most clear days Mount Rainier can be seen to the southwest towering over the Puyallup Valley (as seen on the previous page.) With any new development, it will be important to keep the tallest structures towards the center of the site, with a transition to shorter structures towards the periphery, This will help to preserve views into Downtown, Mount Rainier, and Commencement Bay.

Since the site is situated on top of a former river delta, there are very few topographic variances. This level topography offers great opportunities to build a complete multi-use trail system, for easy navigation throughout the site. This flat site also makes for simpler site preparation during structural infill/ development projects and infrastructure repair/upgrades.

With the lightrail link and regional Sounder rail line only blocks from the site, there is an opportunity to not only add a future lightrail route through the new urban center, but also connect with the regional Sounder rail line. These transportation amenities will allow residents not working in Tacoma the opportunity to make the 30mile commute north to Seattle automobile free. Another transportation opportunity to explore is the use of a gondola to transport pedestrians from Downtown directly to the site. One of the closest Tacoma Link Lightrail stops is approximately 150 feet from the site. A gondola lift station could be located near this stop, offering yet another means of accessing the site, further mitigating the barrier created by the Thea Foss Waterway.

The site is surrounded by water on 3 sides, making the opportunity for access, both physical and visual, virtually unlimited. As previously discussed, the sites relationship with the Puyallup River and surrounding Commencement Bay is deeply imbedded in its identity and will become the major attraction for new business and residents. The waterfront is to be celebrated and the restrictive barriers from the last century of maritime industry are to be broken down. Opportunities to redesign how people interact with the water is endless. Restoration sites, parks, urban trails, educational areas, and cultural sites dedicated not only to the areas industrial past, but more importantly the celebration of the relationship between the delta and Puyallup Tribe that have been in symbiosis for thousands of years before European settlement. The Puyallup Tribe still relies heavily on the salmon harvest from the Puyallup River and this tradition should be afforded a substantial presence on the site.

There are some major restoration efforts underway on the site, including restoration of some shorline along the Puyallup, Thea Foss Waterway, and Middle Waterway. Although these efforts are a good start, they are not substantial enough to really begin to have a major impact on the areas ecology. A major restorative undertaking can occur, transforming a large portion of this underutilized site into a productive ecosystem. This includes the opportunity to restore a large portion of mudflat that would be engineered specifically for salmonoid habitat. This restoration effort could also tie in directly to cultural, research, and education efforts as well. The Puyallup Tribe, restoration research through the University of Washington, and major restoration and degradation prevention education for all members of the population could be afforded a real presence.

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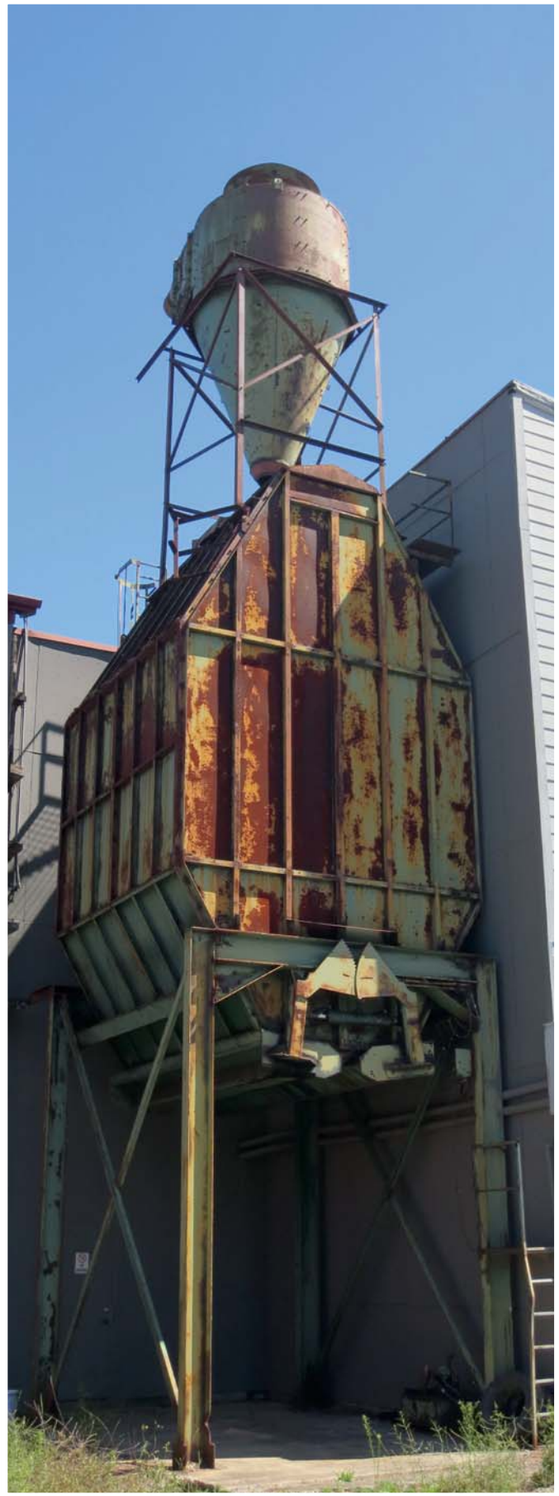


PROGRAMMING

Maritime Industrial
· *Vessel manufacturing*
· *Vessel restoration*
· *Dry docking*
· *Shipping and freight forwarding*
· *Timber processing and export*

Commercial
· *Maritime commercial*
· *Retail centers*
· *Entertainments centers*
· *Commercial mixed-use*

Residential
· *Residential mixed-use*
· *Townhouse/row house*
· *Single family detached*

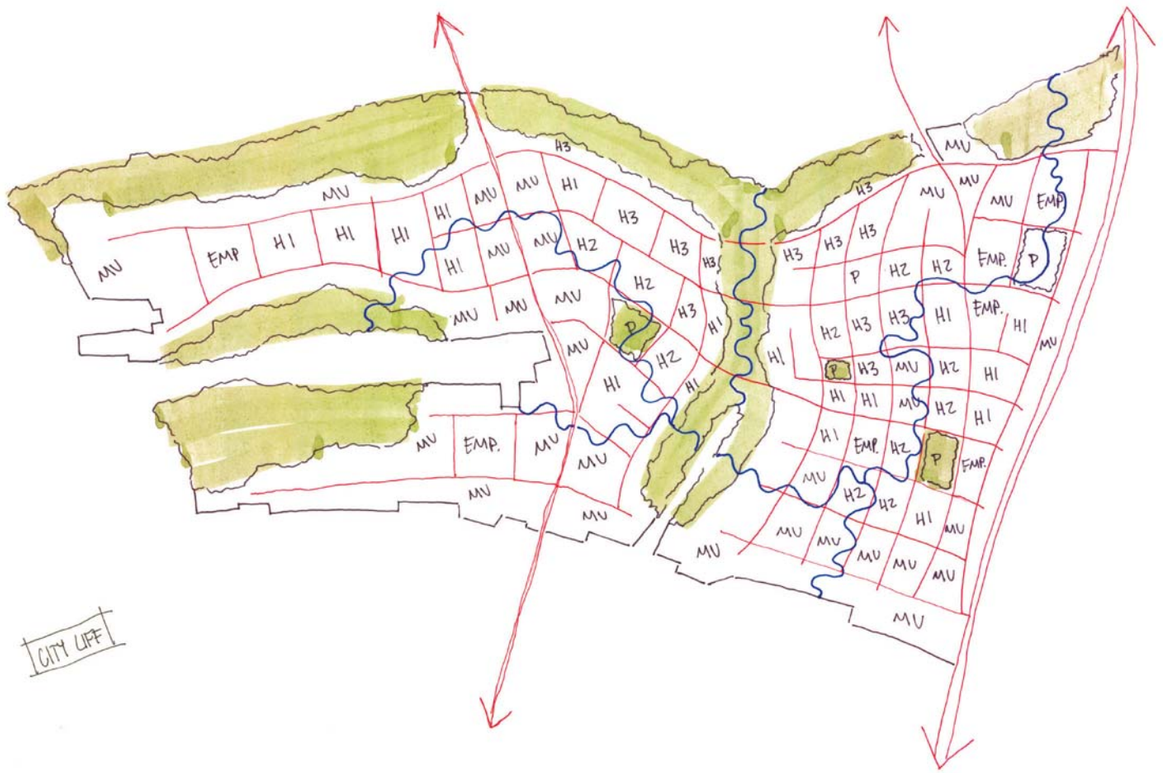
Maritime Industrial Tech/Research
· *Estuarine restoration-UW Extension*
· *General research and development*
· *Maritime industrial technology*

Cultural
• *Puyallup Tribe Cultural Center*
• *Puyallup Tribe Boathouse*

Public Space
• *Waterfront promenade*
• *Sidewalks*
• *Public plazas*
• *Public parks*
• *Educational centers*

Transportation
• *Tacoma Link lightrail extension*
• *Non-motorized pathway/bridge*
• *Commuter Ferry*
• *Gondola*

Restoration
• *Mudflat*
• *Puyallup River shoreline*
• *Commencement Bay Shoreline*

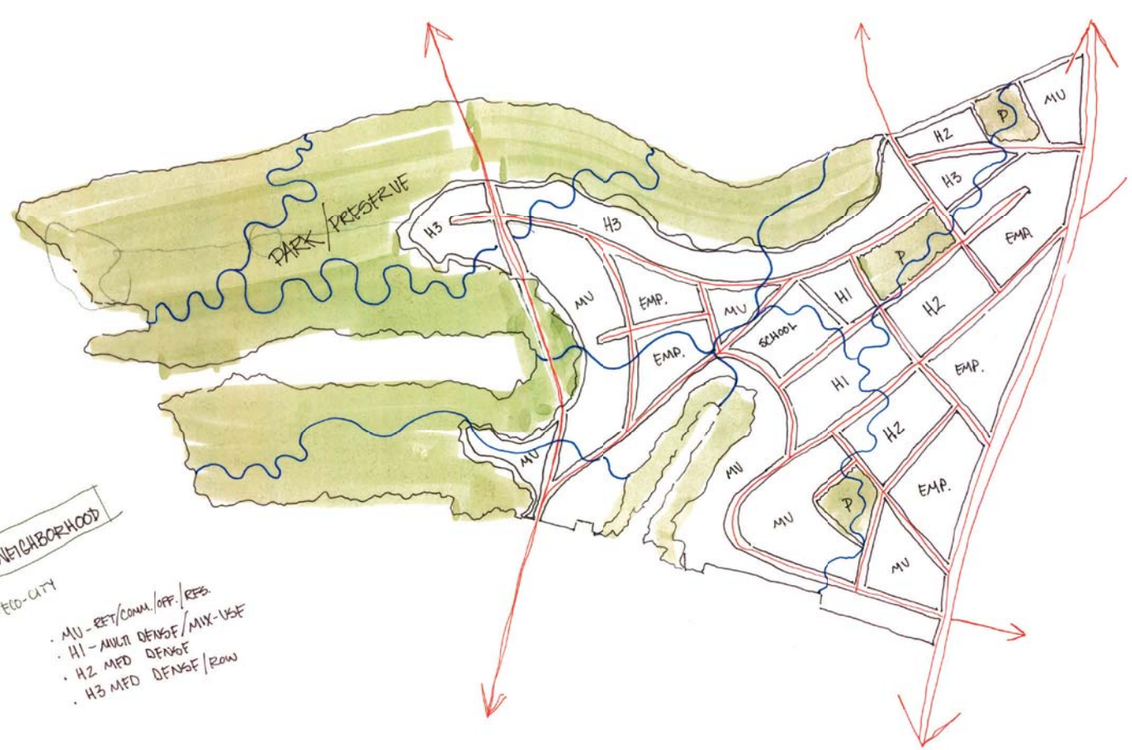


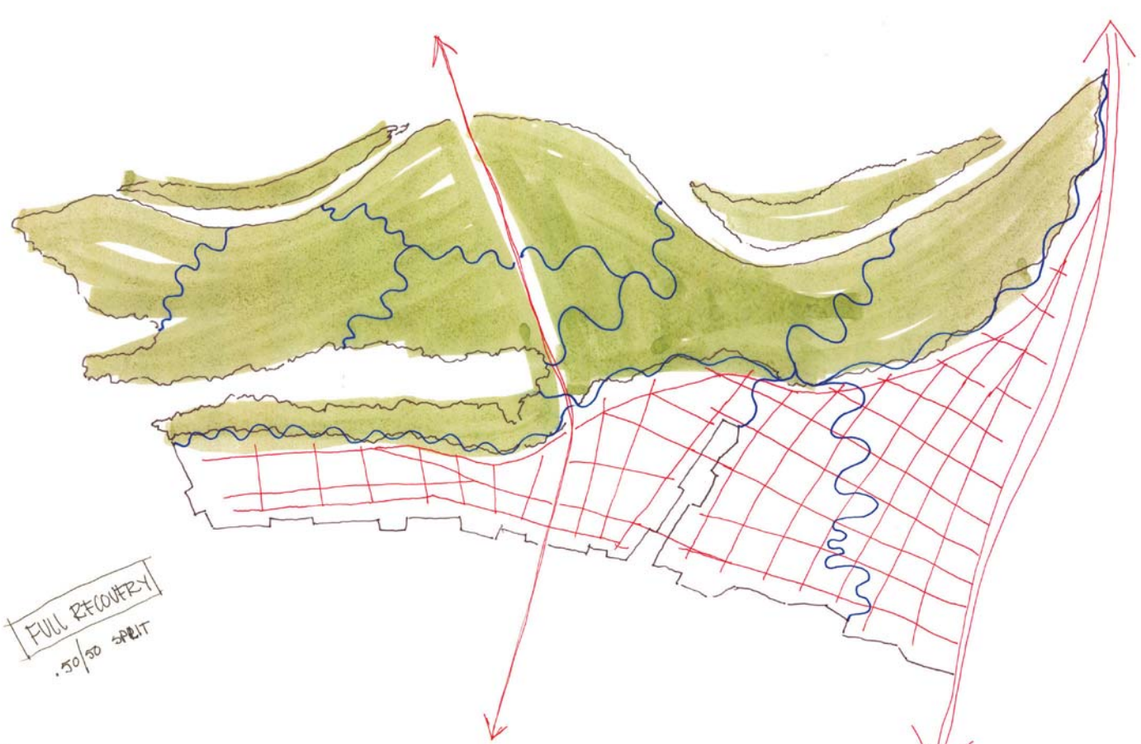
The city of the future will look different than those of today. How different is unclear. The purpose of this project is to re-imagine a site that takes advantage of potential outcomes and mitigates against both current and future constraints. The site is underutilized, largely dilapidated, environmentally unhealthy, and situated in an incredibly prime location for meeting the future demands of the region. It can provide the level of flexibility to grow and adapt with changing economic markets, demographic conditions, and climatic uncertainties. This design will offer a path to help achieve the vision, however, it will require incredible sustained efforts at the local level and a mental shift in current political philosophy.

Because the site is so large, around 750 acres, new infrastructure was used to help compartmentalize the area into blocks. 3 different grids were assembled, taking pattern cues from the adjacent downtown core. These grid patterns were then configured around major transportation flows. As seen in the diagrams, patterns were configured in grids that range from a traditional grid in *Full Recovery* to a more organic form in *Eco Neighborhood*.

In the face of rising seal levels and a major decrease in viable estuarine habitat in the region, restoration is not just used as a site specific programming element, but a major organizational tool. It could be said that major restoration was used as the main organizational element within the site, as the grid was woven around the concept of removed dikes and re-establishment of a section of historic delta mudflat. These restoration efforts would provide habitat for threatened marine species, allow for new seawall setbacks and fill height increases, all while providing a buffer against erosion from increasing storm intensity.

The second level of conceptual arrangement can be seen in the following section with the configuration of broad planning and land-use level spacial programming themes.





Concept 1 aims to keep much of the current foundational maritime industry intact, leveraging that base to build the rest of the site from. New residential mixed-use centers place the workforce within walking distance of major employments centers. Commercial centers are positioned to take advantage of both visitor traffic and adjacencies to residential centers. Major mudflat restoration takes advantage of the current Middle Waterway efforts by continuing restoration through the site, reconnecting the waterway with the Puyallup. All major bridge infrastructure is kept in place, with the addition of one additional bridge extending over the Thea Foss Waterway and continuing on into Downtown.

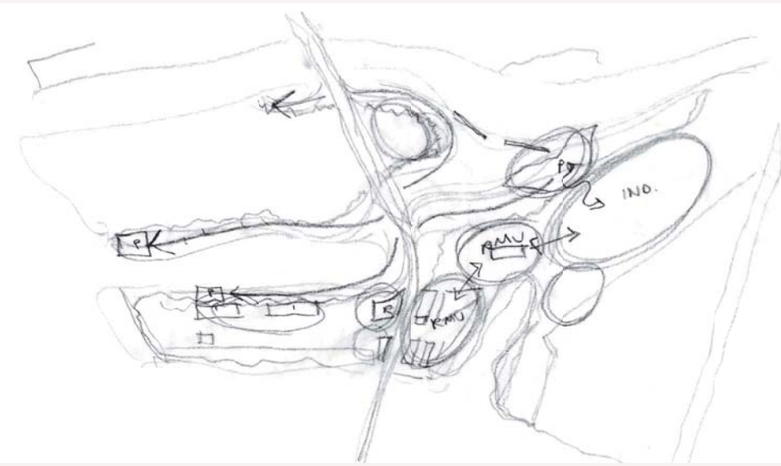
The major weaknesses with Concept 1 are; reliance on current industrial standards keeps dated regimes in place and has no foresight for future technologies. The restoration effort is weak and does not reach far enough into the site. This concept most closely mimics current conditions and does not dedicate enough space to the diversification of economies with the expansion of technology and research in the region.

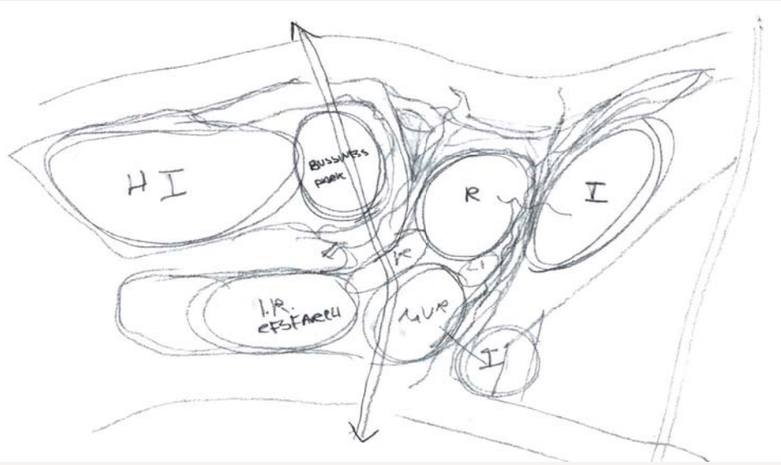
Concept 2 relies more heavily on the expansion of new economies in the region by re-thinking much of the former industrial areas along the Thea Foss Waterway to accommodate new technology and research based industries, rather that manufacturing. Although maritime industrial still has a major presence, as it should, space is much more balanced between the two economic sectors. This allows them to form a more symbiotic relationship, building off one-another. Residential is much less prominent, making this less of a self-sustained (workforce and workplace in the same vicinity) concept. Restoration efforts in concept 2 are now split into two major sites, linking both the Middle Waterway and Thea Foss Waterway with the Puyallup River.

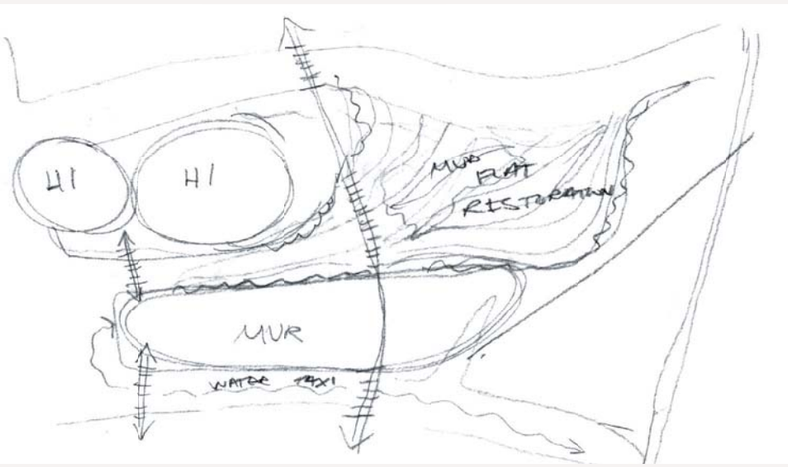
This concept's major weakness is not providing enough space for residential. With a majority of the workforce living off-site, much greater space would need to be devoted for the automobile (wider street designs and large parking facilities), taking away from the walkability of the design.

Concept 3 devotes a majority of the site to estuarine restoration. Although the other programming groups are given much less overall space, it is balanced much more evenly than the previous concepts - specifically the balance of space between workplace and workforce. Commercial centers are positioned towards the core to capture daily movements of the residential workforce. This concept, although largely devoted to restoration, is the best balanced approach.

The one weakness of this concept may be the imbalance that lies between maritime industrial and industrial technology/research, with the latter being afforded much less site space. Although, one must take into account the fact that industrial services require much more space than technology sectors with an equal amount of economic production.



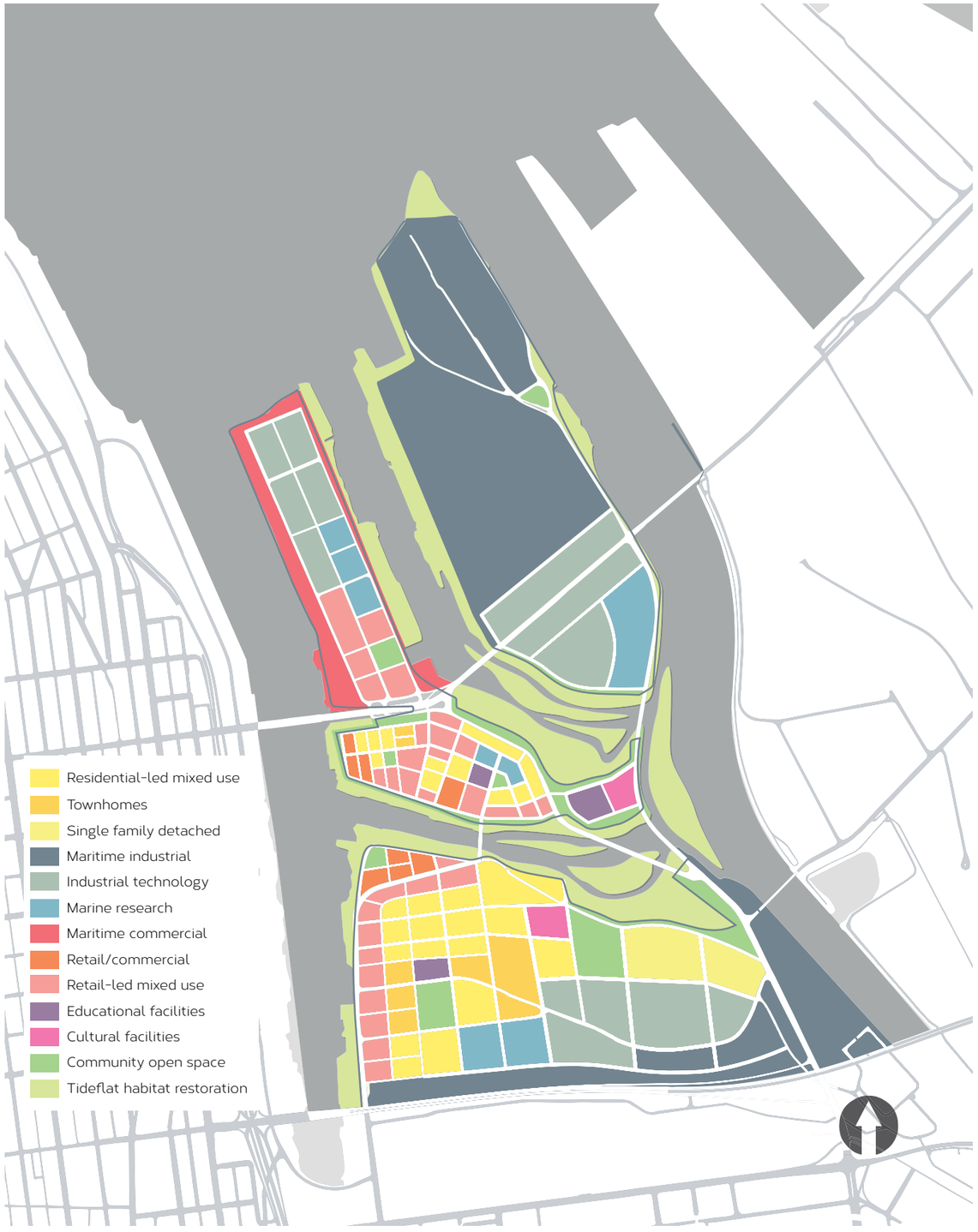




VISION

The vision for The Tacoma Flats is one of cultural growth, ecological restoration, and social inclusion. Fresh spaces and familiar views provide residents and visitors with opportunities for cultural learning, environmental stewardship, and economic growth. What does the city of the future look like? What unforeseen economies will help shape the Pacific Northwest Region through this century? What effects of climate change will be realized? An adaptable city is one that can react to changing circumstances, rapid or otherwise.


Ferry Terminal
Maritime Commercial/ Research Hub
Vessel Manufacturing
Timber Processing
Maritime Industrial
Thea Foss Pedestrian Promenade
Mixed-use Residential Hub
Townhouses
Research & Development Hub
University of Washington Research Extension
Puyallup Tribe Cultural Center
Puyallup Tribe Boathouse
Regional Park and Educational Center
Single-family Residential
Research & Development/ Industrial Hub



LAND USE

The Tacoma Flats are intended to be a robust and multifunctional expansion of the downtown core. In addition, much of the space will be devoted specifically to the current heavy industrial and maritime industrial functions. To capitalize on location and proximity to port function, many new sectors of maritime-based research and technology have been included. These sectors will help to diversify the local economy and stabilize the new base of highly skilled workers that are expected to flood the market over the coming decades. In support of this new economic base, are a diverse array of housing types, with commercial and retail centers to support the permanent resident base. It is to be assumed that new sections of waterfront promenade and a multitude of public transportation options will also support the area as both a local and regional destination.

MUTLI-MODAL

A multitude of transportation options will make The Tacoma Flats one of the best places to be a pedestrian in the country and a major regional destination. No street should be designed without generous space given to both pedestrian and cyclists.

The Tacoma Trail will allow users to navigate the entire site along the shoreline, automobile free. Large pedestrian paths along bridges will link the path across the water, with a pedestrian-only bridge providing the opportunity for users to observe the mudflats form above.

A loop extension of the Tacoma Link lightrail line will provide two stops within The Tacoma Flats, putting the majority of the site within a 5 minute walk of one of the stops. This new loop will also link The Tacoma Flats directly with the Downtown core amenities and regional Sounder commuter rail service to Seattle and Everett.

Spanning from Downtown, across the Thea Foss Waterway, and along to two stops in The Tacoma Mudflats will be a gondola lift loop. The gondola affords the city the ability to implement a non-traditional public transportation option without having to provide space for it along traditional transportation infrastructure corridors. The gondola line can be directed over water, across building tops, and along minor streets and open space.

Although Point Defiance currently has a ferry terminal, it is more than 5 miles from the Downtown core and largely disconnected from public transportation option. A secondary ferry terminal at The Tacoma Flats will directly link residents of downtown to this regional public transportation option.

ROAD NETWORK

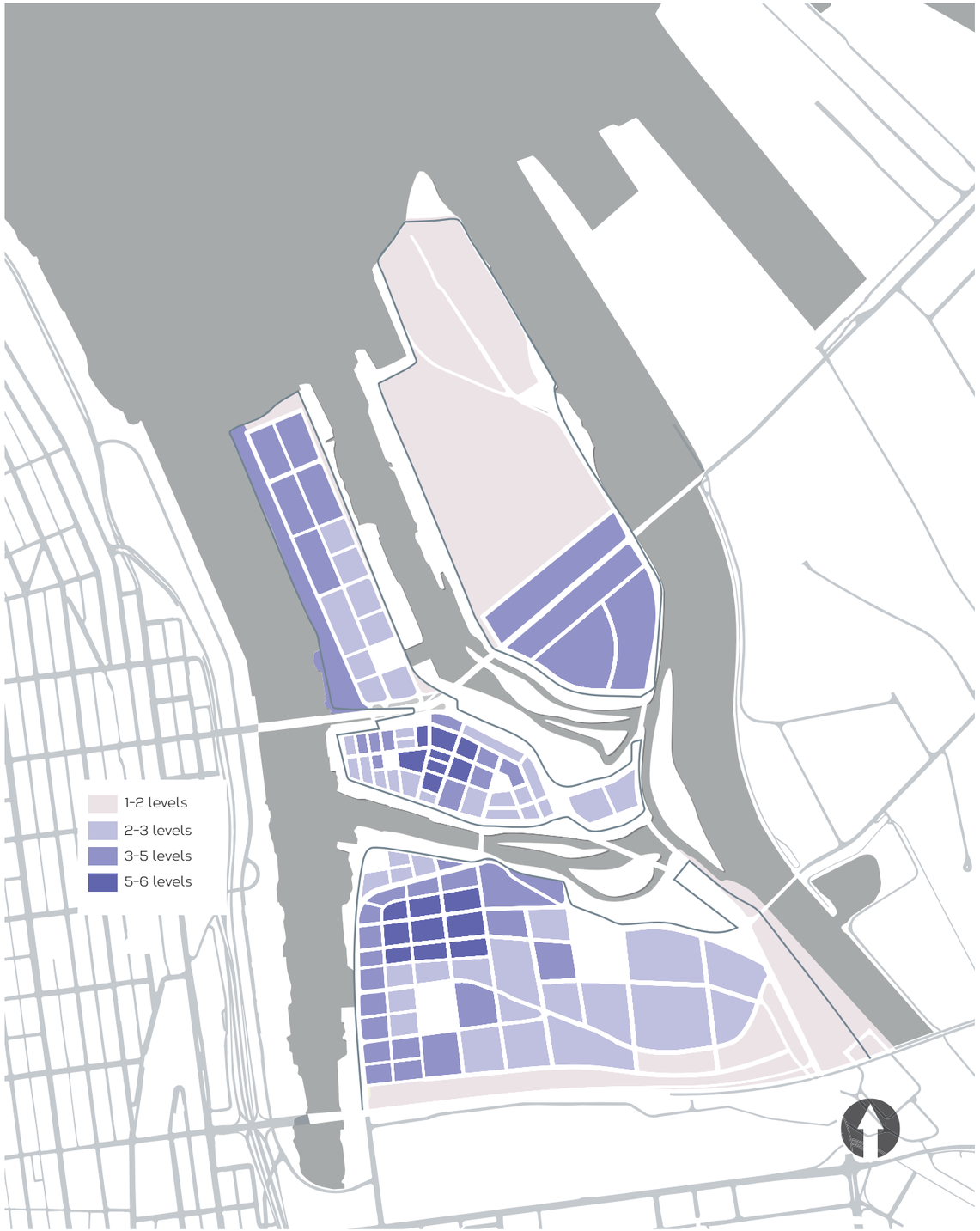
A new grid network of roadways will help to break the site down into traditional small blocks, improving human scale and helping to give prominence to the pedestrian and cyclist experience.

New bridges will need to be constructed to span the mudflats at a number of key points. These bridges are not only critical to the flow of automobile traffic through the site, but critical for pedestrian and bicycle traffic within the site, as they will all contain a major pedestrian component to their design. In addition, these bridges will function as tidal check dams, regulating both fresh and saltwater flow into the inner mudflat restoration areas.

Major intersections are highlighted as areas that may require traffic lights due to the convergence of high volume, 2-lane roadways. The 4-lane roadways within The Tacoma Flats will be retained to
1) directly link port traffic from Downtown through the site and on to the Port of Tacoma and
2) link Interstate 5 truck traffic with maritime industrial functions within The Tacoma Flats (see graphic).

BLOCKS

Blocks have been assembled based on use, site restrictions, and scale. Avoiding the “super block” in which one structure occupies an entire block is a major priority. This type of development decreases interest, pedestrian flow, and can greatly reduce human scale. In addition, it restricts the site from a diversified re-adaptation of structural functions within the block itself, as the entire space in a “super block” is dedicated to one function - often multi-family housing or commercial office center. The super block exception is in a mixed use type of unit where the 1st and/2nd floors are dedicated to multitude of retail/office/commercial function that can be easily readapted to changing markets or technologies. For example, if a coffee shop goes out of business the space can readily adapted to house a landscape architecture and planning studio.



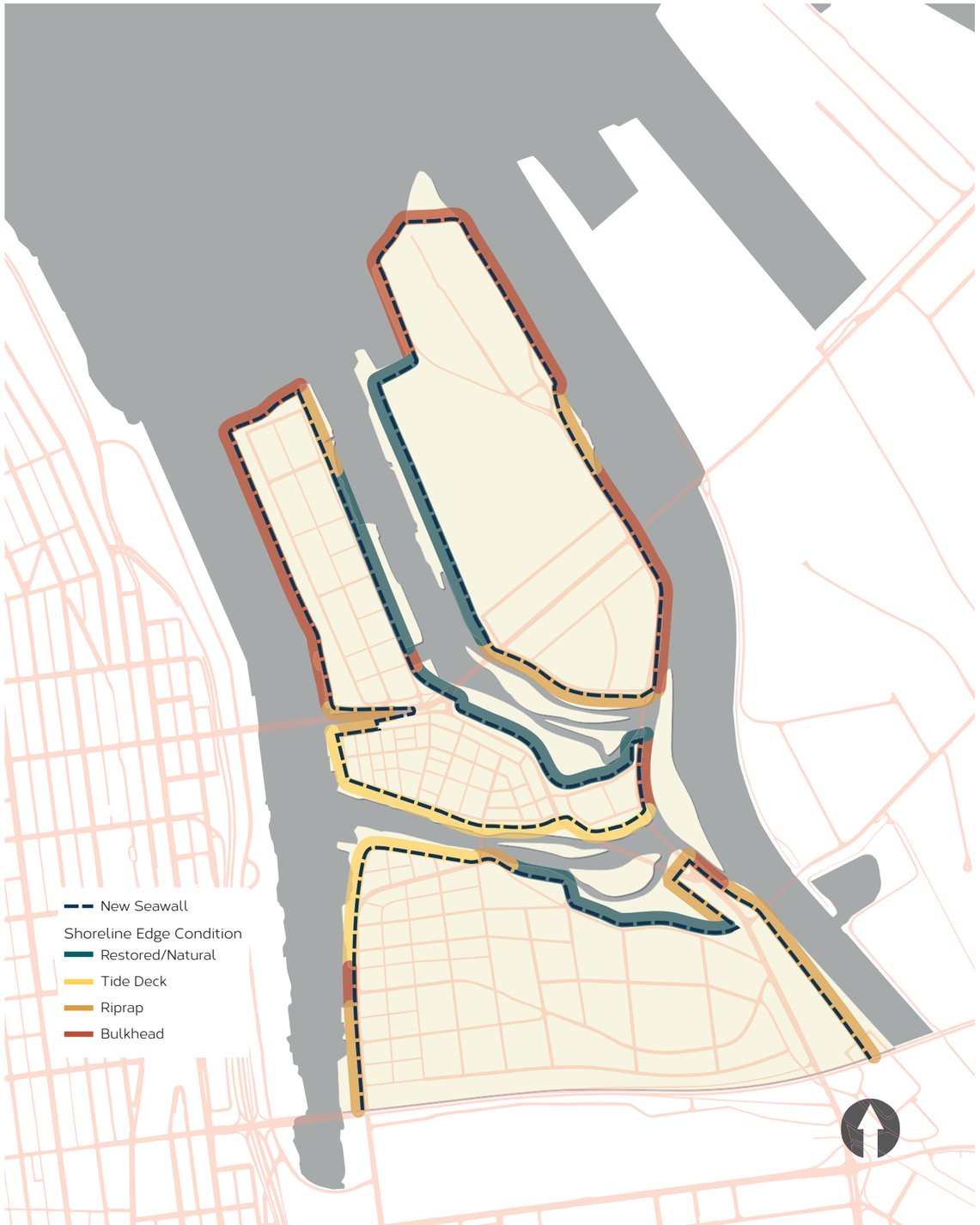
HEIGHTS

Building height limits are established to both drive human-scale interests and retain the exceptional views of surrounding landscapes.
Core centers and areas with the potential for large technology-based corporation presences are allowed the greatest heights.
This is to ensure they are able to employ the large work-forces that will help to boost local economies.
Height limits are then set to provide height transitions from these core and economic centers down to the waterfront, preserving great viewsheds both in and out of The Tacoma Flats.

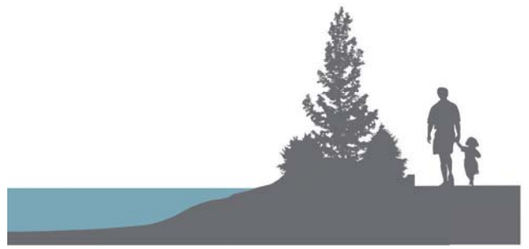
PUBLIC REALM

Neighborhood parks, public plazas, and waterfront promenades act as public stepping stones and neighborhood centers for fairs, markets, and sunny afternoons. But, the largest and most prominent public space within The Tacoma Flats is the small block network of sidewalks, and pedestrian walkways. Here, the design focus is on the pedestrian experience as sidewalks, along with other non-motorized transit options, are given highest priority when establishing corridor arrangements.

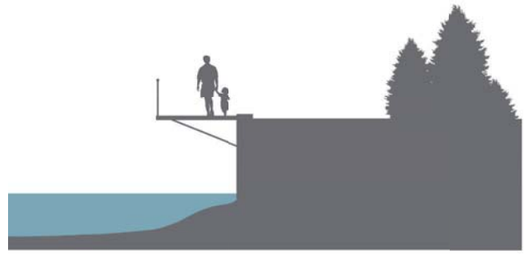
Below is an example of a pedestrian greenway linking the Puyallup Tribe Cultural Center with Downtown.



Restored/Natural

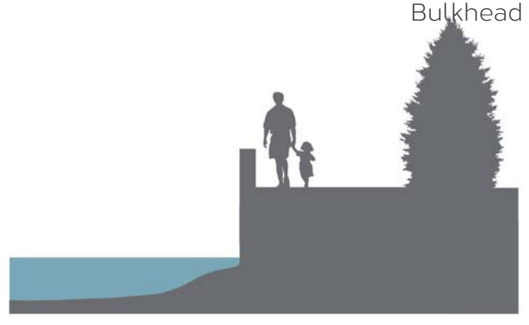


Tide Deck



Riprap

Bulkhead



SHORELINE

As one of the defining opportunities for The Tacoma Flats design, the shoreline interface is the largest public space effort on site. The shoreline promenades and pathways will allow both pedestrians and cyclists to move seamlessly around the majority of the site. The 4 alternative shoreline design applications not only adapt the site to sea-level rise and greater tidal fluctuations, but provide the user with a number of different experiences that celebrate this unique regional environment. This shoreline space is also the major organization feature for development within its area of influence.

These 4 alternative shoreline interfaces should be used where appropriate:

Restored/Natural shorline design should be used along areas where restoration has taken place, allowing users to experience the sights and sounds of the mudflats.

The Tide Deck interface should be used in areas where it is necessary to have bulkhead reinforced fill. This tide deck allows the user to walk out over the mudflats with grand views of the restoration.

Riprap should be used along shorelines with high erosion potential. The lack of a high seawall allows users to walk down onto the rocks and interact the water.

Bulkheads should be used only when necessary along major waterfront promenades and industrial areas.

RESTORATION

Large-scale restoration strategies will help to restore viable salmonoid habitat within the delta. In addition, some ecosystem services will return to help mitigate the runoff of pollutants from both upstream sites and within The Tacoma Flats itself. A series of tidal check dams will control the balance between salt and fresh water inundation into the inner mudflat areas, further stabilizing this fragile ecosystem.

ESTUARY

TIDAL CHECK DAMS

MUDFLAT

LA PROMENADE SAMUEL-DE CHAMPLAIN, QUEBEC

MOVING FORWARD

The Tacoma Flats is template for a more rich and dynamic waterfront environment that reconnects the site to the fabric, both urban and ecological, of Pacific Northwest. The site is reclaimed from the industrial shackles of a time long past and propelled into the future as model for a new standard of symbiosis between the natural and built environment. As the world continues to urbanize and cities bulge with ever-increasing populations, dilapidated urban spaces will become critical components for a re-emergence of viable city infrastructure. The design opportunities expressed within this project are scalable and applicable to a many number of urban sites around the globe.

Implementation of this design is an immense undertaking that would require multiple complex layers of cooperation between all parties involved - local, state, tribal, federal, public, private. The design would have to be implemented in a long phasing process, with a wide array of both public and private funding sources. Although daunting, not near impossible, Tacoma should look to projects like Malmo and Ijburg as an archetype to build a framework for success. These projects prove that the concepts within this document are implementable - they have all been done in some shape, form or fashion - most often times with great success. The Tacoma Flats is not about habitat restoration or connecting people with the sea, it is about **repairing a culture** that has forgotten where it comes from and preparing a city for a future driven by confidence and resiliency.

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Images

All images photographed by Brandon M. Herman with the exception of the following:

Pg. 14-15, Historic Images, <http://www.sparkmag.org/wp-content/uploads/2013/05/Port-of-Tacoma.jpg,> <http://www.pacificcohistory.org/sw2000_3.htm,> < http://www.tacomahistory.org/>, <tacomapubliclibrary.org>

Pg. 16-17, < http://www.tacomahistory.org/>

Pg. 18, <tacomapubliclibrary.org>

Pg. 20, <http://www.flickr.com/photos/savethebay/5376187089/>

Pg. 21, < http://climatechangeandpnw.blogspot.com/>

Pg. 22-23, < http://www.puyalluptribalnews.net/news/view/exhibit-in-olympia-tells-story-of-local-tribal-history/>

Pg. 26-27, <http://buildingoursustainablefuture.blogspot.com/2012/09/european-village-inbo01.html> <http://1.bp.blogspot.com/_wwzAUoYSQrI/S60omx-GD4I/AAAAAAAABJE/wShABVmumwM/s1600/Granville+Island.jpg>, < http://en.cie.nl/projects/55>,

Pg. 28-29, < https://c2.staticflickr.com/6/5308/5838276732_90e7208e06_z.jpg>, < http://water.epa.gov/resource_performance/planning/images/WT-2a_b-Measure.jpg>, < http://www.fotopedia.com/wiki/Nisqually_National_Wildlife_Refuge#!/items/flickr-5838276732>, < http://alamedapointenvironmentalreport.wordpress.com/>, < http://www.beautifulwashington.com/king-county/parks-gardens/bellevue/112-mercer-slough.html>

Pg. 37, <http://farm3.staticflickr.com/2062/2273979744_af59c8d52f_o.jpg.>

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Pg. 76, < http://2.bp.blogspot.com/-djXQjj7wWtI/UeG0X_RtQ2I/AAAAAAAAEx8/SL2oixOQG4c/s1600/DSCN0126.JPG>